

Modeling-Based Processing of Al-Li Alloys for Delamination Resistance, Phase I

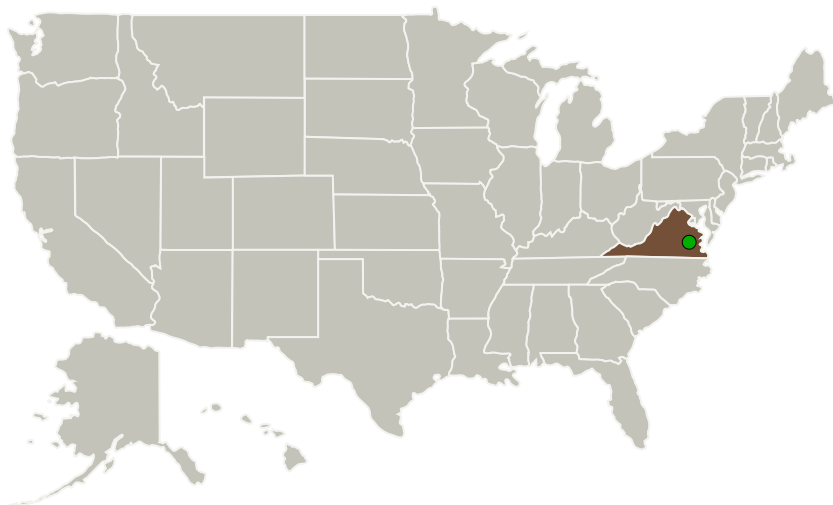
Completed Technology Project (2011 - 2011)



Project Introduction

Al-Li alloys are of interest for use in aerospace structures due to the desirable combination of high strength and low density. However, high strength Al-Li alloys exhibit an intergranular delamination fracture mode which has limited widespread structural applications. Previous work at NASA LaRC, under limited testing, found that the failures tend to be between grains of the two Brass texture component variants. Taylor Factor calculations show these to have severe strain incompatibility. These grain orientations are known to develop as a preferred orientation in Al-Li-X-Zr alloys during severe, hot rolling. This program will verify the results and work with Industry to develop an alternative, delamination-free process.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Black Laboratories, L.L.C.	Lead Organization	Industry Small Disadvantaged Business (SDB), Women-Owned Small Business (WOSB)	Newport News, Virginia
● Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia



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Primary U.S. Work Locations

Virginia

Project Transitions



February 2011: Project Start



September 2011: Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/138320>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Black Laboratories, L.L.C.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

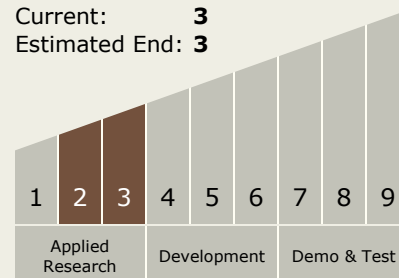
Roy Crooks

Technology Maturity (TRL)

Start: 2

Current: 3

Estimated End: 3



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Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
 - └ TX12.1 Materials
 - └ TX12.1.8 Smart Materials

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System